

December 4, 2010

To: Tracy McNew  
From: Terry Spear  
Re: Review of *Draft Final Remedial Investigation Report for Operable Unit 7 (OU7) of the Libby Asbestos Superfund Site.*

Tracy,

Attached to this letter please find my review comments to the *Draft Final remedial Investigation Report for Operable Unit 7 (OU7) of the Libby Asbestos Superfund Site.*

Please contact me with your questions and comments

*Terry Spear*

Terry Spear, Ph.D.  
Safety, Health & Industrial Hygiene Dept.  
Montana Tech  
1300 West Park St.  
Butte, MT 59701  
Ph: 406-496-4445  
Fax: 406-496-4650

*Review of Draft Final Remedial Investigation Report for Operable Unit 7 (OU7) of the Libby Asbestos Superfund Site.*

This report was well written and a detailed description of the remedial investigation of OU7 was adequately provided. My comments and questions follow.

Page 3-5 Soils: The action level for removal includes a concentration of LA in a specific use area or other yard soil by any analytical method greater than or equal to 1% LA. It is well established that the 1% level is not related to health considerations. The following table contains bulk ash/soil samples collected near Libby and reported as both a percentage and number of structures per gram of bulk material.

Sample	Percentage Reported	Structures/Gram of Bulk Material
A	Trace	18,736,220
B	Trace	8,294,573
C	Trace	18,338,256

The above shows the limitation of the PLM method for characterizing fibers in soil. If a sample from yard soil under a lawn is reported as Bin B1 or Bin B2, and if it is assumed that the soil will stay there, then there is no exposure pathway. If, due to human or natural activity (erosion), the soil is exposed, there will be a significant exposure pathway. In my opinion, removal action levels for soil samples from specific use areas should be analyzed by TEM because of the obvious exposure pathways.

Page 3-1: The first sentence in the last paragraph is somewhat misleading. The sentence reads: "Asbestos fibers are typically less than one micron in diameter and range from several to hundreds of microns in length."

Ambient air sampling trends reported for Libby indicate that greater than 60% of airborne fibers were < 5 um long when analyzed by transmission electron microscopy (TEM) (ATSDR 2003b).

Page 4-1: In the first paragraph the report states: "If new or existing damage was present in the home and could have resulted in the exposure of the residents to vermiculite, then the field team may have, after consultation with or assistance from the property owner, installed temporary barriers (caulking cracks, taping over openings) to prevent additional vermiculite from entering the living space."

Have the homes requiring this type of response been correlated with the presence of visible vermiculite and dust sampling results in the living spaces of these homes? Also, will these homes be inspected in the future to assess the adequacy of the remediation measures; i.e., taping over openings?

Page 4-6 Visible Inspection: Were records kept regarding the storage of material (i.e., Christmas ornaments) in attics containing vermiculite insulation? If removal of vermiculite insulation from an attic is required, how is the issue of stored attic material handled?

Pages 4-6 and 4-7 Dust Sampling: What is the breakdown of microvac samples in each home by type of surface sampled; i.e., porous vs. non-porous surface? Was an analysis performed to determine the collection efficiency of microvac sampling by type of surface?

ASTM (<http://www.astm.org/Standards/D5755.htm>) states: "The collection efficiency of this technique is unknown and will vary among substrates. Properties influencing collection efficiency include surface texture, adhesiveness, electrostatic properties and other factors."

Airborne fibers have been detected during ABS of indoor air in Libby, yet 97% of the dust samples are non-detect for LA. This means that (1) asbestos is coming from outside, and/or, asbestos in indoor dust is not being adequately determined. In my opinion, both surface wipe and microvac surface sampling should be used in the homes in Troy and Libby. One goal of ABS is to gain a better understanding of the relationship between surface dust levels and air levels. This is important "because it is not feasible to perform ABS at every property. Therefore, it makes sense to explore different surface sampling techniques such as wet surface wipe sampling.

There is evidence in the literature that the microvac sampling technique may not be efficient, at least for some types of surfaces. In a study comparing two wipe sampling methods to a microvacuum sampling method on surfaces spiked with lead containing dust, the authors reported that the wipe sampling methods yielded higher recoveries on smooth hard surfaces, but that on carpet, the vacuum method had a significantly higher recovery (S. J. Reynolds, L. Etre, P. S. Thome, P. Whitten, M. Selim and W. J. Popendorf, *Am. Ind. Hyg. Assoc. J.*, 1997, 58, 439-446).

"ASTM D7144 (Microvacuum) is another voluntary consensus standard method currently available for use by industrial hygienists for vacuum sampling of beryllium particles. This standard was recently developed in coordination with experts from DOE sites and it is hoped that ASTM D7144 will fill a need for a reliable vacuum sampling method which was previously lacking. Yet there remains a concern of low collection efficiency when using this practice, thus improved techniques are desired." Kathryn L. Creek, Gary Whitney and Kevin Ashley, Vacuum sampling techniques for industrial hygienists, with emphasis on beryllium dust sampling. *J. Environ. Monit.*, 2006, 8, p. 616

"Despite a few successes, there is a general paucity of reliable performance data for vacuum sampling methods. This is true of standardized protocols as well as of non-standard vacuum sampling methods. Further studies are necessary in order to address this knowledge gap." Kathryn L. Creek, Gary Whitney and Kevin Ashley, Vacuum sampling techniques for industrial hygienists, with emphasis on beryllium dust sampling. *J. Environ. Monit.*, 2006, 8, p. 616

One of the objectives of the remedial investigation for OU7 was to "Adequately characterize the nature and extent of LA contamination in OU7 by investigating building interiors, soil, and ambient air".

Most people, including children and people with compromised health status, spend most of the time in their homes. Is the dust sampling methodology (microvac) used in Troy and OU4 to

identify concentrations of Libby Amphibole in the living spaces of homes the best method to protect public health?

"Microvac samples tend to more accurately reflect potential re-entrainable asbestos, wipe samples tend to more accurately reflect all accumulated asbestos, and passive samples provide a measure of current accumulation rates. Air sampling provides a snapshot in time of airborne fiber levels... A comprehensive, effective approach to settled dust analysis would utilize more than one method to determine historical accumulation, loose versus bound dust, source location, and current accumulation." EPA World Trade Center Expert Technical Review Panel, *On The Issue Of Microvac Sampling*, comments of David M. Newman, May 3, 2004

There is no firm scientific basis for predicting the airborne concentration of asbestos by re-suspension of surface dust containing asbestos. More research is necessary to determine the relevance to human health of specific levels of asbestos-containing dust on surfaces.

Page 4-7: In the first full paragraph the report states: "The TAPE field team selected sample aliquot locations based on the team's visual inspection of the building and estimation of where contaminated dust was most likely to be found."

What criteria was used to establish "where contaminated dust was most likely to be found." ?

Page 4-7: In the second full paragraph the report states: "Field teams used stopwatches to record both the 30-second aliquot intervals and the total composite sample time. The cassette contained dust from a total 1,000 cm<sup>2</sup> surface area and a total of approximately 5 minutes of sampling time."

ASTM 5755 -03, 8.7 states: "A sample area of 100 cm<sup>2</sup> is vacuumed until there is no visible dust or particulate matter remaining. Perform a minimum of two orthogonal passes on the surface within a minimum of 2 min of sampling time."

I am concerned that the ASTM method was not followed in the microvac sampling methods in Troy (or OU4)? Does a 30 second sample from a 100 cm<sup>2</sup> template equate to a 2 minute sample until there is no visible dust or particulate matter remaining. Was an analysis performed to determine the effect of the modified method?

Page 4-15, Table 4-1, TFO 00012: Cease the collection of dust samples as part of TAPE inspection.

It is inconceivable to me that a more comprehensive approach to settled dust analysis utilizing more than one method is not used in the Libby Superfund area, let alone ceasing the collection of dust samples to reduce analytical costs.

SOP for dust sampling: Were attempts made to collect dust samples from locations near attic accesses; i.e., closet accesses or underneath ceiling attic accesses?

Page 4-29 4.6.3 (1): What is meant by the phrase "uncontained vermiculite insulation"?

Page 6-2 Residential Removal Actions: Was any additional sampling (air, surface) performed during and after the residential removal actions?

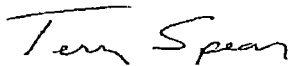
Page 7-4, second full paragraph: This discussion is mind boggling. In my view the evaluation of LA within living spaces of homes is the most critical aspect of the investigation for reasons already stated above. LA fibers are not visible and could certainly be present without the presence of visible vermiculite.

Page 7-6 Environmental Resource Specialist Activities: Was the isolation measure of covering openings between attics and living areas with plastic sheeting considered a permanent isolation of the exposure pathway?

In a related question, is activity based sampling (ABS) planned for Troy?

7-15: If a home is listed for a removal action based on the action level of  $5,000 \text{ s/cm}^2$ , are carpets removed as part of the remedy?

Terry Spear, Ph.D.

A handwritten signature in cursive script that reads "Terry Spear".

Safety, Health & Industrial Hygiene Dept.  
Montana Tech  
1300 West Park St.  
Butte, MT 59701  
Ph: 406-496-4445  
Fax: 406-496-4650